

ED

**Notice of Allowability**

Application No.

10/808,609

Examiner

Thai-Ba Trieu

Applicant(s)

MELCHIOR, JEAN FREDERIC

Art Unit

3748

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed on 07/12/2007.
2. ☒ The allowed claim(s) is/are 6-9, 11-24, 30-36 and 52.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input type="checkbox"/> Other _____   |

### **DETAILED ACTION**

This Office Action is in response to the Amendment filed on July 12, 2007. Claims 6, 8, 9 and 11 were amended; and claims 1-5, 10, 25-29, 37-51, and 53-62 were cancelled.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance: the prior art fails to disclose or renders obvious the claimed combination of a 4-stroke reciprocating engine and a method of operating a 4-stroke reciprocating engine wherein the engine is operating between a minimum speed of rotation  $N_{min}$  and a maximum speed  $N_{max}$  and having a turbocharging unit; an EGR bypass provided between the intake manifold and the exhaust manifold which EGR bypass is dimensioned to transfer a flow of gas between the intake manifold and the outlet manifold without substantial loss of pressure, such that a turbine inlet pressure substantially equal to a compressor discharge pressure; such that, at constant air temperature and with a constant value of the exhaust outlet section  $S_d$ , the turbocharging unit delivers a substantially constant volume of cooled air  $V_c$  when the compressor discharge pressure varies, the constant volume of cooled air  $V_c$  being substantially proportional to the exhaust outlet section  $S_d$

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offered to the hot exhaust gas, and the exhaust outlet section  $S_d$  is selected such that at a turbocharging adaptation speed  $N_a$ , the volume drawn in by the engine is equal to the constant volume  $V_c$ , below the turbocharging adaptation speed  $N_a$ , the volume drawn in by the engine is less than the constant volume of cooled air  $V_c$ , and a flow of the cooled air is deflected toward the turbocharging unit through the EGR bypass, and above the turbocharging adaptation speed  $N_a$  and including the maximum speed  $N_{max}$ , the volume drawn in by the engine is more than the constant volume of cooled air  $V_c$ , and a flow of exhaust gas is drawn in by the engine through the EGR bypass, wherein the EGR bypass has a gas cooler adjustable to control the temperature of the transferred flow of the hot exhaust gas, and wherein the method of operating includes controlling the EGR bypass temperature to create a desired excess of air for combustion in the engine; and including:

" Regarding claim 6:

*the exhaust outlet section  $S_d$  is selectively variable and is controlled at full load, to maintain a parameter at a limiting desired value thereof; and at partial load, to optimize depollution and/or performance according to a map stored in an engine control computer.*

Regarding claim 7:

*the method of operating including controlling the EGR bypass temperature so that a mass of the transferred hot exhaust gas remains substantially equal to a mass of the fresh air up to the speed at which this temperature returns to the exhaust temperature, the mass of the transferred hot exhaust gas becoming greater than the mass of the fresh air above this speed.*

Regarding claim 8:

*the EGR bypass having a gas cooler adjustable to control the temperature of the transferred flow of the hot exhaust gas, the adjustment of the temperature being effected by controlling a bypass of the cooler, and the gas cooler being totally bypassed when the engine does not deliver propulsive power.*

Regarding claim 9:

*the EGR bypass having a gas cooler adjustable to control the temperature of the transferred flow of the hot exhaust gas, the adjustment of the temperature being effected by controlling a bypass of the cooler; and for cold starting and operating at idling speed, the exhaust outlet section  $S_d$  and/or a timing of engine valves being adjusted so that the excess of combustion air is minimal for a desired level of depollution.*

Regarding claim 11:

*the EGR bypass having a gas cooler adjustable to control the temperature of the transferred flow of the hot exhaust gas, the adjustment of the temperature being effected by controlling a bypass of the cooler; the adaptation speed  $N_a$  being substantially equal to  $N_{min}/2$  so that the volume of the transferred flow of the hot exhaust gas is at least equal to that of the fresh air, and the minimum temperature of the transferred flow of the hot exhaust gas is close to the temperature of the fresh air so that a mass of the transferred flow of the hot exhaust gas is at least equal to that of the fresh air at the minimum speed used  $N_{min}$  in order to depollute down to the minimum speed  $N_{min}$ .*

Regarding claim 12:

*the exhaust outlet section  $S_d$  offered to the hot exhaust gases is adjustable between a minimum  $S_{d\ min}$  and a maximum  $S_{d\ max}$  by one or a combination of the following: adjustment of a variable section of a gas distributor of the turbines, opening of a bypass between an inlet and an outlet of the turbines, and passage from a series configuration to a parallel configuration of the turbines, the turbocharging adaptation speed  $N_a$  thus being adjustable, in a continuous or discontinuous manner, between two values  $N_{a\ min}$  and  $N_{a\ max}$ ."*

### ***Conclusion***

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTB  
August 07, 2007

A handwritten signature in black ink, appearing to read "Thai-Ba Trieu", with a long horizontal flourish extending to the right.

Thai-Ba Trieu  
Primary Examiner  
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